HEALTH POLICY RESEARCH SERIES
Discussion Paper #91-1

PHYSICIAN MEDICARE UTILIZATION 1986-1988: NATIONWIDE AND FOR THE 10 LARGEST CARRIERS

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January 1991

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Introduction

Since its inception in 1965 the Medicare program has been plagued by increases in its budget, increases which have become even more dramatic in the last decade. Initial reform activities were focused on payments for hospital costs, the largest percentage of the Medicare budget. These activities culminated with the introduction in 1983 of a new way of paying for hospital stays, Diagnostic Related Groups (DRGs).

After DRGs were introduced, attention began to focus on the second largest component of Medicare costs -- physician payments. Medicare payments for physicians' services increased at an annual rate of 16% from 1978-1987.[1] In 1987 Medicare expenditures on physician services were $22 billion, 27% of the Medicare budget.[2] The reality of these demonstrated increases in physician payments in the last 10 years, combined with future projections of use if the increases cannot be moderated, has resulted in considerable legislation and executive attention given to physician payment reform.

In this paper we will discuss overall physician utilization trends nationwide and for the ten largest carriers. The paper will begin with a discussion of the changes in Medicare physician reimbursement during our period of study, 1986-1988. It then describes the data sources and methodology used. Following that, changes in selected utilization measures from 1986 to 1988 are described. The paper concludes with a discussion of the policy implications of these findings.

Review of Changes in Medicare Physician Payment, 1986-1988

Historically, all Part B services have been reimbursed on a fee-for-service basis using customary, prevailing, reasonable charge (CPR) methodology. According to this

methodology the amount allowed by Medicare (the Medicare reasonable charge or allowed charge) is the lowest of: (1) the submitted charge; (2) the customary charge which is the physician's median charge during the previous calendar year; (3) the prevailing charge, which is the 75th percentile of all customary charges for physicians in the same specialty and the same geographic area during the previous calendar year, adjusted by the Medicare Economic Index (MEI); or (4) a charge determined to be reasonable by the Medicare carrier. The MEI reflects increases in physician office practice costs and earnings in the general economy.

During the last ten years there has been heightened Congressional interest in physician payment reform. Since 1982 the budget reconciliation bills (TEFRA82, DEFRA84, COBRA85, COBRA86, COBRA87) have included many specific changes in physician payment. Four of these -- the Participating Physician and Supplier (PAR) Program, the Laboratory Fee Schedule, Fee Freezes and Medicare Economic Index (MEI) Adjustments, and Limits on Overvalued Surgical Procedures -- which are of importance during our study period are described below.

The Participating Physician and Supplier Program

The Participating Physician and Supplier (PAR) Program was created by the Deficit Reduction Act (DEFRA) of 1984 (P.L. 98-369). The program permits physicians and suppliers who sign a form voluntarily agreeing to accept assignment on all Medicare claims to be listed in a directory of participating providers and to receive advantages in billing and fee screen updates. From July 1984 through April 1986 non-PAR physicians were not allowed to increase their actual charges. This resulted in their actual fee increases not being recognized in future fee screen updates. In May 1986 PAR physicians received a fee screen update to October 1985; non-PAR physicians screens remained frozen through December 1986.

Beginning in January 1987 differential charge updates and maximum allowable actual charge (MAAC) limits were established.[3] In addition, non-PAR physicians performing elective surgery costing more than $500 were required to provide in writing to the beneficiary the estimated actual charge, the Medicare approved charge and the balance due to the physician. In 1988 and 1989 prevailing and customary charge levels were differentially updated with PAR physicians and primary care services receiving advantages. MAAC limits on non-PAR physicians were lowered to a smaller percentage of the level for PAR physicians.[4]

The Laboratory Fee Schedule

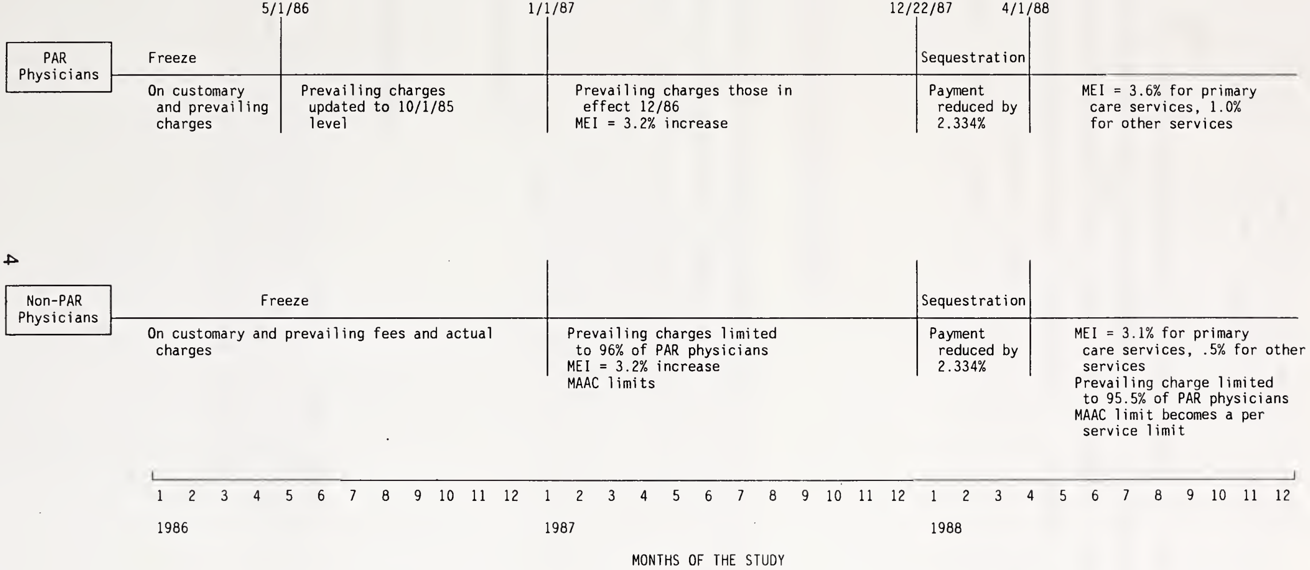
In July 1984 carrier laboratory fee schedules were established, set at 60% and 62% of prevailing charges for lab tests, and assignment (at 100% reimbursement) was mandated for non-physician billers. In July of 1986 a national limitation of laboratory amounts was enacted so that carriers paid laboratory services on the basis of the lesser of the submitted charge, the carrier's fee schedule amount, or the national limitation amount.[5] Automated and "lowest charge level" (LCL) tests[6] identified in 1979 for special pricing limitations at the carrier 25th percentile levels were further reduced in April 1988 by 8.3%.

Fee Freezes and MEI Adjustments

Figure 1 shows the freezes and adjustments in customary and prevailing and actual fees during the study. As can be seen in Figure 1, there was a freeze on customary and prevailing fees for PAR doctors until May 1, 1986. The freeze for non-PAR doctors which was on both the customary and prevailing fees and their actual charges extended until December 31, 1986. In 1987 the prevailing charges became those in effect December 31, 1986 for PAR doctors and were restricted to 96% of the

Figure 1

PHYSICIAN FREEZES AND ADJUSTMENTS DURING THE STUDY PERIOD


5/1/86
1/1/87
12/22/87
4/1/88
PAR Physicians
Freeze
On customary and prevailing charges
Prevailing charges updated to 10/1/85 level
Prevailing charges those in effect 12/86
MEI = 3.2% increase
Sequestration
Payment reduced by 2.334%
MEI = 3.6% for primary care services, 1.0% for other services
Non-PAR Physicians
Freeze
On customary and prevailing fees and actual charges
Prevailing charges limited to 96% of PAR physicians
MEI = 3.2% increase
MAAC limits
Sequestration
Payment reduced by 2.334%
MEI = 3.1% for primary care services, .5% for other services
Prevailing charge limited to 95.5% of PAR physicians
MAAC limit becomes a per service limit
1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12
1986
1987
1988
MONTHS OF THE STUDY

PAR amount for non-PAR doctors. The MEI increase allowed was 3.2%. Maximum Allowable Actual Charge (MAAC) limits were established for non-PAR doctors.

Fees paid to physicians from December 22, 1987 and March 31, 1988, were reduced by 2.334% due to the deficit control activities of 1987. Beginning April 1, 1988, MEI increases allowed were: 3.6% for primary care services of PAR physicians; 1.0% for other services of PAR physicians; 3.1% for primary care services non-PAR physicians, and 0.5% for other services of non-PAR physicians. Non-PAR physicians were limited to 95.5% of PAR physicians and the MAAC limit became a per service rather than average limit.

Limits on Overvalued Surgical Procedures

Beginning January 1987, prevailing charges for cataract surgery were reduced by 10% for 1987 and an additional 2% in 1988. Effective April 1988, the prevailing charge for ophthalmic ultrasound procedures were restricted to 5% of the prevailing charge for cataract surgery with an intraocular lens implant. In addition the prevailing charges for twelve procedures[7] identified as overvalued were reduced 2% below their FY 1987 level. They were further reduced to the extent that they were above 85% of the weighted national average.[8]

Data Sources and Methodology

Below the source files and populations that were used to generate the data analyzed in this paper are described. First we describe the main data source, the BMAD files. Following that we examine the beneficiary population.

BMAD Files

The Part B Medicare Annual Data (BMAD) files are part of the Medicare data collection system maintained by HCFA. Medicare carriers produce the BMAD files based on data received on claims and contained in their prevailing charge files, beneficiary history files, and physician/supplier history files. The BMAD consists of four files: procedure, prevailing, provider, and beneficiary.

The main data used in this paper are from the procedure files. In addition we utilized data files supplied by HCFA containing: information on Medicare eligibility from the Health Insurance (HI) master file; data on users from the HCFA Beneficiary file; and procedure codes and corresponding relative value units. Procedures which were not services were not considered in the analysis.

Understanding procedure coding in the files was of special importance. Three levels of procedure coding are included in the files. Level I are uniform CPT codes established and maintained by the American Medical Association. Level II codes are uniform codes specified by HCFA. Level III codes are carrier-specified codes. Because Relative Value Unit (RVU) conversions were only available for Level I codes, Level II and Level III codes for physician services were converted to their corresponding Level I codes.[9] Also important to note is that procedure code modifiers were not considered in this study. Hundreds of modifiers exist in the data base, many of which are not explained. Some modifiers raise the allowed charges, some lower them and some merely specify a particular circumstance (i.e. left or right side) without changing the allowed charge. While it would have been desirable to make such adjustments, information was not available to do so.

Beneficiary Population

The beneficiary population was expressed in terms of person-years of eligibility or person-years of use adjusted for HMO enrollment and for each of the carriers for carrier crossover activity. Carrier crossover activity occurs when beneficiaries in a particular geographical carrier area receive services in another carrier area. Table 1 shows, for the national population and by carrier, the number of person-years of eligibility, the percentage of person-years of eligibility with use, and the percentage adjustment for HMO enrollment and crossover activity in 1986, 1987, and 1988.

The national average percent of eligibles with use increased from 78% to 80% during the study period. While most carrier figures fall within a limited range of variation, several carriers have percentages of use over 90% (the District of Columbia, Delaware, and North Carolina).

Beneficiaries who are enrolled in HMOs generally receive most of their services through the HMO. No claims will appear on the BMAD file for services received from the HMO. Although it is true that beneficiaries enrolled in Group Practice Prepayment Plan (GPPP) HMOs can go outside the HMO for service and many do go outside their HMOs[10], we decided to remove them from the eligibility numbers. Other options would have been to leave them in or to take out a proportion of them. Because we elected to remove all of them, the eligibility numbers are slightly understated.

Border crossers are those beneficiaries who have services processed through carriers outside the carrier area in which they reside. Border crossing beneficiaries may be literally crossing their state borders (e.g. snowbirds wintering in the sunbelt) or simply crossing their carrier borders (where a given state is serviced by multiple carriers, such as New York and California), or seeking medical care at specialty facilities in other states, such as those going to Minnesota's Mayo Clinic. The eligibility numbers per carrier were adjusted to reflect this activity.

Table 1

NUMBER OF PERSON-YEARS OF ELIGIBILITY, PERCENTAGE OF PERSON-YEARS OF ELIGIBILITY WITH USE, AND PERCENTAGE OF ADJUSTMENT FOR HMOs AND BORDER CROSSERS, BY CARRIER, 1986 - 1988

	1986			1987			1988		
	Person-Years Of Eligibility*	% With Use**	% Adj HMOs, Border Crossers	Person-Years Of Eligibility*	% With Use**	% Adj HMOs, Border Crossers	Person-Years Of Eligibility*	% With Use**	% Adj HMOs, Border Crossers
All Carriers	30,445,351	77.9	-4.9	31,030,721	78.9	-5.6	31,486,709	80.2	-5.6
Alabama 00510 BC & BS of Alabama	514,277	78.2	-3.7	523,307	80.1	-3.6	531,404	81.3	-3.7
Alaska 01020 Aetna Life & Casualty	17,281	62.1	-19.3	18,577	65.6	-18.8	19,948	64.9	-16.9
Arkansas 00520 Arkansas BS	350,385	78.4	-6.3	354,528	80.2	-6.4	358,044	81.0	-6.8
Arizona 01030 Aetna Life & Casualty	399,843	77.7	-3.2	417,654	79.1	-5.4	433,398	80.2	-3.7
California 00542 California Physicians Service (d/b/a BS of California)	1,474,102	77.9	-15.9	1,517,939	72.1	-17.1	1,556,222	71.6	-18.8
California 02050 TransAmerica Occidental Life	1,393,865	78.5	-1.8	1,421,666	76.5	-4.2	1,435,994	75.5	-5.1
Colorado 00550 Rocky Mtn. Hospital & Medical Service (d/b/a BS of Colorado)	291,333	78.3	-4.3	301,241	75.6	-8.5	310,414	73.6	-13.0
Connecticut 10230 Travelers Insurance Company	425,854	79.0	-3.6	431,313	80.5	-4.7	434,673	81.2	-4.4
District of Columbia 00580 Pennsylvania BS	243,522	94.3	16.3	250,274	90.9	17.3	254,614	96.0	12.0

Table 1 (Continued)

NUMBER OF PERSON-YEARS OF ELIGIBILITY, PERCENTAGE OF PERSON-YEARS OF ELIGIBILITY
WITH USE, AND PERCENTAGE OF ADJUSTMENT FOR HMOs AND BORDER CROSSERS
BY CARRIER, 1986 - 1988

	1986			1987			1988		
	Person-Years Of Eligibility*	% With Use**	% Adj HMOs, Border Crossers	Person-Years Of Eligibility*	% With Use**	% Adj HMOs, Border Crossers	Person-Years Of Eligibility*	% With Use**	% Adj HMOs, Border Crossers
Delaware 00570 Pennsylvania BS	74,303	93.0	0.8	76,498	123.6	0.1	78,568	157.9	28.2
Florida 00590 BS of Florida	1,983,233	79.3	-7.6	2,046,896	82.8	-8.1	2,107,004	83.2	-3.7
Georgia 13110/01040 The Prudential Insurance Co. of America Aetna Life & Casualty	632,102	78.8	1.7	647,048	80.5	1.3	659,699	82.2	1.0
Hawaii 01120 Aetna Life & Casualty	101,915	77.7	-20.0	106,700	63.6	-31.3	110,957	63.4	-31.7
Iowa 00640 BS of Iowa	418,744	79.1	-12.9	423,145	79.6	-13.3	426,029	81.0	-13.8
Idaho 05130 Equicor, Inc. -- Equitable Corporation	111,061	77.3	-17.2	113,967	78.3	-17.5	116,354	78.3	-18.7
Illinois 00621 BS of Illinois	1,365,258	69.2	-8.8	1,384,522	70.8	-8.9	1,395,987	72.8	-8.9
Indiana 00630 Associated Insurance Companies (d/b/a BC & BS of Indiana)	671,066	74.8	-6.4	683,978	77.0	-7.7	693,476	80.4	-7.8
Kansas 00650 BS of Kansas	274,012	77.0	-16.7	276,838	76.2	-17.2	278,523	79.4	-14.4

Table 1 (Continued)

NUMBER OF PERSON-YEARS OF ELIGIBILITY, PERCENTAGE OF PERSON-YEARS OF ELIGIBILITY WITH USE, AND PERCENTAGE OF ADJUSTMENT BY HMOs AND BORDER CROSSERS BY CARRIER, 1986 - 1988

	1986			1987			1988		
	Person-Years Of Eligibility*	% With Use**	% Adj HMOs, Border Crossers	Person-Years Of Eligibility*	% With Use**	% Adj HMOs, Border Crossers	Person-Years Of Eligibility*	% With Use**	% Adj HMOs, Border Crossers
Kansas & Missouri 00740 BS of Kansas City	229,211	82.6	4.3	232,857	83.2	3.9	235,156	80.3	1.1
Kentucky 00660 BC & BS of Kentucky	469,623	73.6	-6.8	477,919	77.4	-7.0	484,256	81.4	-4.8
Louisiana 00528 Arakansas BC & BS	460,925	72.6	-1.4	471,862	76.0	-1.4	480,225	78.9	-1.8
Massachusetts 00700 BS of Massachusetts	790,920	81.2	-1.7	795,842	80.8	-2.7	797,795	82.3	-3.8
Maryland 00690 BS of Maryland	354,629	76.9	-3.4	362,316	82.2	-4.0	368,309	76.8	-3.5
Maine 21200 BS of Massachusetts	164,092	79.0	-7.1	166,716	81.7	-6.7	168,546	82.3	-6.6
Michigan 00710 BC & BS of Michigan	1,104,919	82.3	-5.7	1,124,169	83.7	-6.6	1,140,240	88.3	-5.2
Minnesota 00720 BC & BS of Minnesota	289,409	58.6	-52.2	292,585	55.1	-54.4	294,682	61.8	-49.2
Minnesota 10240 The Travelers Insurance Company	231,856	73.4	38.2	236,312	69.3	32.2	240,048	70.9	23.8
Missouri 11260 General American Life	514,388	81.3	0.3	520,814	82.2	0.2	525,500	84.3	-2.0

Table 1 (Continued)

NUMBER OF PERSON-YEARS OF ELIGIBILITY, PERCENTAGE OF PERSON-YEARS OF ELIGIBILITY
WITH USE, AND PERCENTAGE OF ADJUSTMENT BY HMOs AND BORDER CROSSERS
BY CARRIER, 1986 - 1988

	1986			1987			1988		
	Person-Years Of Eligibility*	% With Use**	% Adj HMOs, Border Crossers	Person-Years Of Eligibility*	% With Use**	% Adj HMOs, Border Crossers	Person-Years Of Eligibility*	% With Use**	% Adj HMOs, Border Crossers
Mississippi 10250 The Travelers Insurance Company	330,574	72.1	-13.0	335,295	73.3	-13.1	338,925	76.2	-11.6
Montana 00751 BS of Montana	98,120	74.1	-5.6	100,525	75.5	-6.0	102,636	76.6	-8.0
N. Carolina 13340/05535 The Prudential Insurance Co. of America/ Equicor, Inc.--Equitable Corporation	764,001	91.1	4.4	786,220	96.9	4.0	805,682	99.0	3.9
N. Dakota & S. Dakota 00820 BS of North Dakota	188,461	88.6	6.3	191,331	91.3	5.4	192,985	93.3	9.7
Nebraska 00645/00655 BC of Iowa BS of Kansas	212,439	71.6	-9.7	214,481	73.4	-10.5	215,489	80.3	-6.4
New Hampshire & Vermont 00780 BC & BS of Massachusetts	188,088	78.4	-11.0	190,881	79.7	-13.0	193,427	80.7	-12.6
New Jersey 13310/00860 The Prudential Insurance Co. of America/ Pennsylvania BS	997,259	83.7	0.0	1,010,146	83.7	0.3	1,016,454	79.0	-5.7
New Mexico 01360 Aetna Life & Casualty Company	143,862	68.6	-14.1	149,172	66.6	-16.6	153,984	70.5	-16.8
Nevada 01290 Aetna Life & Casualty Company	99,164	70.5	-0.8	105,614	70.9	-4.5	112,204	73.4	-1.0

Table 1 (Continued)

NUMBER OF PERSON-YEARS OF ELIGIBILITY, PERCENTAGE OF PERSON-YEARS OF ELIGIBILITY WITH USE, AND PERCENTAGE OF ADJUSTMENT BY HMOs AND BORDER CROSSERS BY CARRIER, 1986 - 1988

	1986			1987			1988		
	Person-Years Of Eligibility*	% With Use**	% Adj HMOs, Border Crossers	Person-Years Of Eligibility*	% With Use**	% Adj HMOs, Border Crossers	Person-Years Of Eligibility*	% With Use**	% Adj HMOs, Border Crossers
New York 00801 BS of Western New York	793,319	77.0	-6.5	803,284	78.4	-7.9	810,154	78.1	-9.7
New York 00803 Empire BC & BS	1,261,369	84.2	4.4	1,264,278	84.8	6.4	1,259,117	85.1	2.8
New York 14330 Group Health Incorporated	267,351	53.7	-44.3	267,189	53.9	-42.8	265,252	53.4	-42.8
Ohio 16360 Nationwide Mutual Insurance Company	1,352,295	77.2	-3.4	1,378,507	80.2	-3.8	1,400,228	83.8	0.4
Oklahoma 01370 Aetna Life & Casualty Company	405,083	69.9	-9.7	411,074	73.6	-10.0	415,631	76.1	-10.9
Oregon 01380 Aetna Life & Casualty Company	360,502	75.9	-14.2	369,766	74.1	-18.5	378,265	73.9	-21.5
Pennsylvania 00865 Pennsylvania BS	1,733,154	80.1	-0.1	1,758,347	79.9	0.0	1,775,333	81.4	-1.7
Puerto Rico 00973 Seguros de Servicio de Salud de Puerto Rico	251,391	72.0	-6.4	258,987	72.6	-6.8	264,575	76.0	-6.4
Rhode Island 00870 BS of Rhode Island	145,204	83.2	-5.9	146,509	83.1	-5.5	146,990	84.2	-8.3
Railroad 10071 The Travelers Insurance Company	830,684	76.5	-5.0	825,529	78.5	-5.6	815,690	78.9	-5.6

Table 1 (Concluded)

NUMBER OF PERSON-YEARS OF ELIGIBILITY, PERCENTAGE OF PERSON-YEARS OF ELIGIBILITY WITH USE, AND PERCENTAGE OF ADJUSTMENT BY HMOs AND BORDER CROSSERS BY CARRIER, 1986 - 1988

	1986			1987			1988		
	Person-Years Of Eligibility*	% With Use**	% Adj HMOs, Border Crossers	Person-Years Of Eligibility*	% With Use**	% Adj HMOs, Border Crossers	Person-Years Of Eligibility*	% With Use**	% Adj HMOs, Border Crossers
South Carolina 00880									
BC & BS of South Carolina	373,068	68.1	-14.3	385,543	71.1	-15.6	396,744	76.1	-9.5
Tennessee 05440									
Equicor, Inc.--Equitable Corporation	607,964	79.9	7.3	619,532	81.9	6.0	629,301	84.7	7.3
Texas 00900									
Group Medical/Surgical Services	1,552,526	78.2	2.4	1,595,190	80.9	1.9	1,633,482	82.6	1.2
Utah 00910									
BS of Utah	126,350	81.1	0.0	130,568	83.4	-0.9	134,863	83.7	-0.7
Virginia 10490									
The Travelers Insurance Company	534,638	72.4	-7.5	548,330	73.5	-8.0	560,219	75.0	-8.9
Washington 00930									
Washington Physician Service	518,391	78.0	-8.2	534,192	79.1	-9.0	548,234	79.4	-8.4
Wisconsin 00951									
Wisconsin Physicians' Service Corporation	645,542	80.7	-6.5	655,570	82.1	-7.2	663,427	83.0	-6.2
West Virginia 16510									
Nationwide Mutual Insurance Company	271,834	67.9	-17.8	275,288	69.9	-18.1	278,355	72.2	-16.1
Wyoming 05530									
Equicor, Inc.--Equitable Corporation	40,590	59.1	-37.4	41,890	60.5	-38.5	43,000	62.1	-37.1

BC = Blue Cross, BS = Blue Shield

* Unadjusted person years of eligibility

** Unadjusted person years of use divided by unadjusted person years of eligibility

Adjustments for HMOs and border crossing activity varied widely by carrier. Table 1 column 3 shows the percentage adjustment by carrier. The range of adjustments vary dramatically. In 1988, these adjustments impacted the number of person-years of eligibility from reducing person-years by 49% to increasing them by 28%.

Changes in Selected Utilization Measures, 1986-1988

The top part of Table 2 shows summary information across all types of services, places, and specialties on the overall growth from 1986 to 1988 in various utilization measures. The data presented are restricted to services (as opposed to items, such as mileage) in the data files.

In general, substantial growth is shown on all the utilization measures examined. The overall number of services has increased 19%, RVUs 17%, allowed charges 27%, billed charges 28%. Because the numbers of eligibles and users are increasing, when the data are examined per eligible and per user, the percentage increases shown above are smaller. As was seen in Table 1, Medicare person-years of eligibility have increased 3.4% from 1986 to 1988 to approximately 31.5 million person-years. Excluding HMO person-years of eligibility during which data are generally not processed through the carriers, Medicare person-years of eligibility increased 3% from 1986 to 1988. The percentage of eligibles with use increased from 78% in 1986 to 80% in 1988. Thus the per user rates of increases in the utilization measures increased more slowly than the eligibility rates of increase. The rate of increase in rates per eligible for services is 16% compared to 11% for users. For allowed charges the increase in the rate per user was 23% as compared to 19%. For billed charges it was 26% as compared to 21%.

Table 2

GROWTH IN SERVICES, RVUs, AND ALLOWED AND BILLED CHARGES
1986 – 1988

	1986	1987	1988	% change
# Services	551,813,965	601,499,197	654,638,959	18.63
# Services per User	23.673462	24.927175	26.257221	10.91
# Services per Elig	19.048873	20.525864	22.018900	15.59
# RVUs	5,740,511,576	6,229,140,687	6,740,665,114	17.42
# RVUs per Service	10.402983	10.356024	10.296767	-1.02
Allowed $	20,955,365,964	24,498,062,029	26,555,039,543	26.72
Allowed $ per RVU	3.650435	3.932815	3.939528	7.92
Allowed $ per Elig	723.388945	835.984320	893.183587	23.47
Billed $	29,232,862,596	33,494,013,650	37,454,670,217	28.13
Billed $ per RVU	5.092379	5.376987	5.556524	9.11
Billed $ per Elig	1,009.131966	1,142.966745	1,259.794649	24.84

By Selected Carrier

	# Services/Eligible		% Change In Services/User	# RVUs/Service		% Change in Charges		
	1986	% Change		1986	% Change	Al/RVU	Allowed	Billed
CA Blue Shield	20.6	7.7	12.4	10.8	0.7	4.2	15.3	18.7
CA Occidental	24.2	9.8	8.6	10.7	2.0	4.0	15.9	21.0
TX	18.2	26.4	18.5	10.6	–1.5	7.1	38.7	37.1
FL	18.7	49.6	48.1	11.9	–15.8	14.6	59.7	58.2
IL	18.3	7.3	1.6	12.9	–17.6	37.2	24.0	15.2
MI	21.0	13.0	5.6	9.9	4.8	–3.0	19.1	22.2
OH	20.9	–1.1	–5.0	9.5	7.4	19.4	36.6	33.0
NJ	21.5	7.5	7.5	9.5	6.0	4.5	14.4	17.5
NY Empire	20.8	11.5	8.1	9.8	3.4	5.2	19.1	17.6
PA	20.6	–5.8	–9.0	10.2	1.1	10.2	5.8	8.6

RVUs are of importance in this analysis because they provide us with an intensity measure for services billed. As discussed earlier, RVUs used in this analysis were from a HCFA-supplied tape. Because procedure code numbers existed in the BMAD file that were not in the HCPCS file we imputed these missing RVUs.[11] Note also that modifiers are ignored in assigning RVU values to procedure codes. This means that to the extent that modifiers affect the intensity of services performed and the incidence of modifiers of this type has changed, the change in measures involving RVUs (RVUs per service, allowed charge per RVU, billed charge per RVU) would be misstated.

When measures of service intensity are considered, RVUs per service decreased 1%. This represents an increase in the use of lower valued procedures. For measures of price, allowed charges per RVU and billed charges per RVU increased 8% and 9% respectively. These price variables measure the increase in charges adjusted for intensity of service. However, it should be noted that the allowed and billed charge per RVU increase was almost entirely during the period 1986-1987. Only a small amount of the increase from 1986-1988 for allowed and billed charges per RVU was in the period 1987-1988.

By Carrier

The bottom part of the table presents summary information by carrier for the 10 carriers having the most eligibles and allowed charges. Together these 10 carriers account for 47% of the person-years of eligibility and 55% of the allowed charges. They are arranged by area of the country: the West (two California carriers), followed by the Southwest (Texas), the South (Florida), the three Midwest carriers (Illinois, Michigan and Ohio), and three Eastern carriers (New Jersey, New York Empire, and Pennsylvania).

The columns of the bottom half of the table define important utilization values and increases in utilization values to be compared across the 10 carriers and against the total for all carriers in the top of the table. These 8 columns in order from left to right are: number of services per eligible in 1986, percent change in number of services per eligible from 1986-1988, percent change in number of services per user from 1986-1988, number of RVUs per service in 1986, percent change in RVUs per service 1986-1988, percent change in allowed charges per RVU, percent change in allowed charges, percent change in billed charges.

As can been seen in the table, there is considerable variation by carrier. While in general the increase in number of services per eligible was 16%, the carriers presented here have ranged from a decrease of 6% (Pennsylvania) to an increase of 50% (Florida). Two of the three carriers which were the lowest utilizers in 1986 had the largest increase. The number of RVUs per service in general tended to decrease slightly but only three of the carriers presented show negative changes in RVUs per service. These were Illinois (-18%), Florida (-16%) and Texas (-2%). In general, they were states which had a relatively large number of RVUs per service in the base year. Allowed charges per RVU increased for all the carriers listed except Michigan. The rate of increase was highest for Illinois followed by Ohio and Florida. Some of these increases may be caused in part by the ignoring of procedure modifiers in assigning RVU values discussed above. More moderate increases were found for New Jersey and the two California carriers. Allowed and billed charges went up very dramatically for Florida, Texas and Ohio. The increase in allowed and billed charges in Florida and Texas is being driven by a large increase in the number of services per eligible. The increase in Ohio is due more to an increase in price and in the intensity of service used.

By Procedure Group and Carrier

The top of Tables 3 through 6 gives the national averages for all utilization variables for medical procedures, surgical procedures, radiology procedures and laboratory procedures. The bottom part of the tables shows the distribution along eight of these utilization variables and increase in utilization for the ten carriers having the largest number of person-years of eligibility, and the largest amount of allowed charges processed. These eight variables are the same as in Table 2.

Medical Procedures

Allowed charges for medical procedures, about 9 billion dollars in 1986, make up 44% of total allowed charges (Table 3). The percentage of total charges for medical procedures has remained relatively stable from 1986-88. In 1988, medical services allowed charges were more than 11.7 billion dollars.

Medical services per eligible have increased less than total services per eligible (9% as compared to 16%). However, medical RVUs per service have increased slightly (+3%) where all services showed a decline (-1%). Allowed charges per medical RVU also increased faster than allowed charges per all RVUs (10% as compared to 8%). However, as with the national data, most of the increase in allowed dollars per medical RVU is in the 1986-1987 period.

For medical services, the increase in number of services per eligible was greatest for Florida (+45%) and to a lesser extent Michigan (+23%) and Texas (+15%). As was the case for total services, these were carriers where the number of services per eligible was relatively low in 1986. The number of RVUs per medical service decreased for the four carriers with the highest number of medical RVUs per service in 1986. Florida decreased 9%, Illinois 3%, Pennsylvania 2% and Michigan 1%. Two of

Table 3

GROWTH IN MEDICAL SERVICES, RVUs, AND ALLOWED AND BILLED CHARGES
1986 – 1988

	1986	1987	1988	% change
# Services	310,837,002	335,212,080	349,057,345	12.30
# Services per User	13.335269	13.891773	14.000505	4.99
# Services per Elig	10.730237	11.438947	11.740607	9.42
# RVUs	2,457,074,306	2,677,466,638	2,834,111,552	15.34
# RVUs per Service	7.904703	7.987381	8.119329	2.72
Allowed $	9,199,785,391	10,893,211,428	11,720,287,709	27.40
Allowed $ per RVU	3.744203	4.068476	4.135436	10.45
Allowed $ per Elig	317.580855	371.725483	394.214010	24.13
Billed $	12,576,251,192	14,413,896,799	15,896,497,819	26.40
Billed $ per RVU	5.118384	5.383408	5.608988	9.59
Billed $ per Elig	434.138020	491.867140	534.681597	23.16

By Selected Carrier

	# Services/Eligible		% Change In	# RVUs/Service		% Change in Charges		
	1986	% Change	Services/User	1986	% Change	Al/RVU	Allowed	Billed
CA Blue Shield	12.0	3.2	7.6	7.6	3.3	7.6	17.0	16.9
CA Occidental	13.6	-1.1	-2.1	8.1	9.8	9.9	18.7	19.1
TX	10.3	14.8	7.6	7.5	6.3	10.7	40.5	34.8
FL	9.3	45.0	43.6	9.5	-8.6	27.5	87.0	82.6
IL	11.4	1.2	-4.3	8.4	-2.7	20.5	21.2	13.4
MI	9.2	22.8	14.8	8.4	-1.1	-10.6	12.7	15.0
OH	10.7	5.4	1.2	7.6	6.2	16.0	39.8	28.3
NJ	11.2	2.3	2.2	8.1	2.1	7.8	8.1	10.5
NY Empire	12.5	7.1	3.7	7.9	2.0	7.8	15.6	12.7
PA	12.6	-7.9	-11.1	8.2	-2.0	14.3	3.8	5.3

Table 4

GROWTH IN SURGICAL SERVICES, RVUs, AND ALLOWED AND BILLED CHARGES 1986 - 1988

	1986	1987	1988	% change
# Services	45,767,483	58,221,351	66,665,753	45.66
# Services per User	1.963478	2.412794	2.673928	36.18
# Services per Elig	1.579914	1.986774	2.242314	41.93
# RVUs	97,163,042	105,041,095	112,182,335	15.46
# RVUs per Service	2.122971	1.804167	1.682758	-20.74
Allowed $	7,783,832,805	8,901,966,129	9,505,831,217	22.12
Allowed $ per RVU	80.111044	84.747461	84.735544	5.77
Allowed $ per Elig	268.701516	303.775216	319.730362	18.99
Billed $	10,970,933,229	12,472,318,846	13,743,202,685	25.27
Billed $ per RVU	112.912615	118.737517	122.507725	8.50
Billed $ per Elig	378.721700	425.611747	462.255123	22.06

By Selected Carrier

	# Services/Eligible		% Change In Services/User	# RVUs/Service		% Change in Charges		
	1986	% Change		1986	% Change	Al/RVU	Allowed	Billed
CA Blue Shield	2.3	16.1	21.1	1.9	-8.4	2.5	11.2	17.1
CA Occidental	1.6	88.7	86.7	3.0	-39.9	-1.6	11.0	21.1
TX	1.5	54.8	45.0	2.4	-21.7	5.2	32.6	34.1
FL	1.7	105.3	103.2	2.3	-45.0	5.3	31.6	32.4
IL	1.2	54.5	46.2	3.5	-50.1	57.3	23.9	13.6
MI	2.4	-11.2	-17.0	1.4	28.2	3.7	22.5	24.2
OH	1.7	37.3	31.9	1.7	-16.1	7.0	32.7	34.6
NJ	1.9	13.0	13.0	1.6	5.8	0.1	14.9	18.2
NY Empire	1.6	45.4	40.9	2.0	-18.8	0.9	16.9	18.1
PA	1.9	4.3	0.7	1.5	-7.2	3.0	0.4	5.4

Table 5

GROWTH IN RADIOLOGY SERVICES, RVUs, AND ALLOWED AND BILLED CHARGES
1986 – 1988

	1986	1987	1988	% change
# Services	68,103,072	72,374,574	76,369,120	12.14
# Services per User	2.921701	2.999328	3.063124	4.84
# Services per Elig	2.350949	2.469746	2.568689	9.26
# RVUs	463,115,706	499,590,964	556,094,465	20.08
# RVUs per Service	6.800217	6.902851	7.281666	7.08
Allowed $	2,608,172,805	3,073,892,124	3,460,826,803	32.69
Allowed $ per RVU	5.631795	6.152817	6.223451	10.51
Allowed $ per Elig	90.035334	104.895057	116.405539	29.29
Billed $	3,542,420,614	4,089,701,448	4,763,059,498	34.46
Billed $ per RVU	7.649104	8.186099	8.565198	11.98
Billed $ per Elig	122.286001	139.559050	160.206373	31.01

By Selected Carrier

	# Services/Eligible		% Change In	# RVUs/Service		% Change in Charges		
	1986	% Change	Services/User	1986	% Change	Al/RVU	Allowed	Billed
CA Blue Shield	2.2	4.8	9.3	6.9	8.8	1.7	18.2	23.1
CA Occidental	2.5	4.9	3.8	6.5	8.6	8.7	23.1	26.2
TX	2.3	17.5	10.1	6.5	7.3	10.4	44.7	42.2
FL	2.5	12.0	10.9	7.2	10.3	10.3	50.7	52.5
IL	2.4	1.4	-4.1	8.8	-16.9	56.7	34.9	22.5
MI	3.0	12.9	5.4	7.0	8.5	1.1	28.3	37.5
OH	2.9	-0.4	-4.3	6.4	5.0	20.7	36.0	36.9
NJ	2.1	17.2	17.2	6.9	14.6	6.7	37.7	45.5
NY Empire	2.2	11.2	7.8	6.5	14.5	9.2	36.6	31.5
PA	2.8	-4.1	-7.4	7.1	10.5	16.8	24.7	24.5

Table 6

GROWTH IN LABORATORY SERVICES, RVUs, AND ALLOWED AND BILLED CHARGES
1986 – 1988

	1986	1987	1988	% change
# Services	127,106,408	135,691,192	162,546,741	27.88
# Services per User	5.453013	5.623279	6.519663	19.56
# Services per Elig	4.387772	4.630395	5.467289	24.60
# RVUs	1,777,480,197	1,936,732,672	2,395,474,733	34.77
# RVUs per Service	13.984190	14.273090	14.737144	5.38
Allowed $	1,363,574,963	1,628,992,348	1,868,093,814	37.00
Allowed $ per RVU	0.767139	0.841103	0.779842	1.66
Allowed $ per Elig	47.071239	55.588562	62.833675	33.49
Billed $	2,143,257,561	2,518,096,557	3,051,910,215	42.40
Billed $ per RVU	1.205784	1.300177	1.274031	5.66
Billed $ per Elig	73.986244	85.928806	102.651555	38.74

By Selected Carrier

	# Services/Eligible		% Change In	# RVUs/Service		% Change in Charges		
	1986	% Change	Services/User	1986	% Change	Al/RVU	Allowed	Billed
CA Blue Shield	4.1	17.8	23.0	14.3	5.7	-3.1	23.2	32.3
CA Occidental	6.5	15.6	14.3	14.2	4.1	-6.7	11.7	24.5
TX	4.1	50.5	41.0	14.8	2.3	-5.0	52.1	55.0
FL	5.1	57.1	55.5	14.7	2.8	-0.6	77.7	79.8
IL	3.3	15.1	8.9	15.1	-2.8	12.2	28.3	25.3
MI	6.4	7.9	0.8	14.3	8.6	-1.3	19.9	20.1
OH	-5.6	-25.7	-28.7	16.6	-18.1	115.1	40.8	48.7
NJ	6.4	11.9	11.9	15.0	3.3	5.7	17.4	18.1
NY Empire	4.5	12.0	8.5	12.8	11.7	10.1	35.3	33.0
PA	3.4	-4.9	-8.2	14.3	10.2	2.7	8.4	15.8

these four carriers (Florida and Illinois) also had decreases in the number of RVUs per service. Although for the nation, allowed charges per medical RVU increased 10%, allowed charges per medical RVU decreased for Florida (-8.6%). Florida leads the ten biggest carriers in its increase in allowed charges per medical RVU (+28%). This was more than the national increase shown for all services (28% as compared to 8%). Allowed and billed charges increases for Florida are very dramatic increases (87% and 83%). Texas and Ohio also have very large increases in medical procedures allowed and billed dollars: 41% (allowed) and 35% (billed) for Texas and 40% (allowed) and 28% (billed) for Ohio.

Surgical Procedures

Surgical procedures allowed charges make up about 37% of total charges, $7.8 billion in 1986 (Table 4). The percentage of the total comprised of surgical procedures has decreased slightly from 37.1% in 1986 to 35.8% in 1988. In 1988 total allowed charges for surgical procedures were $9.5 billion.

The number of surgery services increased dramatically (46% over the time period). However, this increase was linked to a strong decrease in the intensity of surgical service use with surgical RVUs per service decreasing 21%. Allowed charges per surgical RVU increased 6%. The increase would have been slightly higher if only the 1986-1987 period was considered. Further investigations of the increase in number of surgical services indicates that this finding is due to a sharp increase in the use of relatively minor procedures such as blood drawing, injections and minor surgical procedures. Most of this increase also appears to be based on procedures by provider numbers which are not identified as surgical specialties.

The strong percentage increases in number of services per eligible and the strong decreases in the number of RVUs per service are within the general practice,

medical specialties and other specialty groups as reflected in Table 7. Note that dermatologists who use many surgical codes for dermatological surgery are classified as medical specialists and that radiologists who provide a number of diagnostic procedures involving injections are in the "other specialties" group. It also should be noted that the most common surgical procedure number, routine venipuncture for the collection of specimen(s), increased in use by 126% over this period, resulting in 77.7 million dollars in allowed charges in 1988. This may be a procedure where the collection cost was previously included as part of another procedure charge (for example, the office visit or a laboratory charge) but by 1988, the practice developed of charging separately for this service.

The bottom of Table 4 shows tremendous variation in the use variables by carrier. Florida increased 105% in its number of surgical services per eligible and Michigan decreased its number by 11%. Southern California (Occidental) increased in the number of surgical services per eligible by 89%, Texas 55% and Illinois 55%. RVUs per service decreased for everyone except Michigan and New Jersey where they increased 28% and 6% respectively. The decrease was most pronounced for Illinois, Florida and Southern California. Illinois' allowed charges per RVU look very different within the context of the other carriers. While changes for the other carriers were in the -2% to +7% ranges, Illinois increased by 57%. Allowed charges went up substantially for Ohio, Texas and Florida.

This demonstrates a differential pattern of surgical procedures increases by carrier. Florida shows large increases in surgical service use (105%) and a dramatic decrease in RVUs per service (-45%). Southern California, Illinois, Texas, New York (Empire) and Ohio also demonstrate a similar but less pronounced pattern. Northern California and Pennsylvania show the pattern but not so dramatically. New Jersey shows a 13% increase in the number of services per eligible and 6% increase in allowed charges per RVU. Michigan shows an 11% decrease in services per eligible and a 28% increase in number of RVUs per service, completely against the trend. It

Table 7

GROWTH IN SERVICES, RVUs*, ALLOWED AND BILLED CHARGES FOR ALL SERVICES, MEDICAL SURGICAL, RADIOLOGICAL, AND LABORATORY PROCEDURES, BY PROVIDER SPECIALTY, 1986 – 1988

	# of Services/Eligible		#RVUs/Services		% Change In
	1986	% Change	1986	% Change	Allowed $/RVU
All Services	19.049	15.6	10.403	–1.0	7.9
General Practice	3.146	6.8	6.600	–2.6	11.5
Medical Specialties	6.506	13.4	8.410	0.1	10.1
Surgical Specialties	2.770	13.5	25.489	0.9	4.7
Other Specialties	6.626	22.8	7.858	–2.7	8.7
Medical Procedures	10.730	9.4	7.905	2.7	10.5
General Practice	2.302	2.4	6.867	1.8	11.8
Medical Specialties	4.846	9.7	8.359	2.2	10.2
Surgical Specialties	1.708	12.2	8.676	1.7	9.8
Other Specialties	1.875	14.8	7.303	5.1	9.0
Surgical Procedures	1.580	41.9	2.123	–20.7	5.8
General Practice	0.168	62.6	0.852	–41.5	12.8
Medical Specialties	0.495	54.4	0.928	–25.9	13.6
Surgical Specialties	0.652	17.4	3.739	–2.9	4.3
Other Specialties	0.265	66.0	1.183	–36.0	–1.0
Radiological Procedures	2.351	9.3	6.800	7.1	10.5
General Practice	0.076	4.9	4.259	2.1	9.0
Medical Specialties	0.145	6.9	6.717	16.4	3.8
Surgical Specialties	0.172	12.7	5.163	19.3	–16.0
Other Specialties	1.958	9.3	7.048	5.7	14.2
Laboratory Procedures	4.388	24.6	13.984	5.4	1.7
General Practice	0.601	8.3	9.004	13.0	1.0
Medical Specialties	1.021	12.0	10.492	11.1	1.0
Surgical Specialties	0.238	12.5	9.695	9.1	–5.6
Other Specialties	2.528	34.7	16.982	–0.1	2.2

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* RVUs for all services are medical RVUs. RVUs for medical, surgical, radiological, and laboratory procedures are their own procedure group's RVUs.

may indicate that providers in some of the states appear to be billing these smaller surgical procedures on a more regular basis than in other carrier areas.

Radiological Procedures

Allowed charges for radiological procedures were 2.6 billion in 1986 rising to 3.5 billion in 1988 (Table 5). They represented approximately 12% of all charges: 12.4% in 1986, 12.5% in 1989 and 13.0% in 1988. The number of radiological services per eligible increased 9%, less than the percent increase in number of services per eligible found for all services. The intensity of radiology services billed increased 7% and the allowed charges per RVU increased 11%. Again, this increase in allowed charge per RVU is primarily in the 1986-1987 period. The increases reported are a little larger than those reported for medical services, resulting in a 33% increase in allowed charges for radiology as compared to 27% for medical services.

The changes in the number of services per eligible by carrier ranged from a 4% decrease for Pennsylvania to a 18% increase for Texas. With respect to intensity of services, most of the carriers saw increases ranging from 5% to 15%, however, one carrier, Illinois, showed a 17% decrease. Illinois also showed a dramatic increase in allowed charges per RVU that might point to a problem in that carrier's coding which has resulted in higher RVUs per service in 1986. In 1986, Illinois' number of RVUs per service was the highest of all the ten biggest carriers, 8.8 as compared to a carrier average of 6.8 in that year. Other than Illinois where the data look suspicious, Ohio had the largest increase in allowed charges per RVU averaging 21% followed by Pennsylvania at 17%. Five carriers' increases ranged from 7% to 10% in allowed charges per RVU. Two carriers (Michigan and California Blue Shield) had increases of 1% to 2%.

Laboratory Procedures

Laboratory procedures accounted for 1.4 billion dollars in allowed charges in 1986 (Table 6). They made up 7% of total allowed charges in 1986, 1987 and 1988 with their allowed charges rising to 1.6 billion in 1987 and 1.9 billion in 1988. Laboratory growth in number of services (28% versus 19%) and intensity of service (5% versus -1%) were faster than for all services, but allowed charges per RVU decreased at a slower rate (2% versus 8%). Note that this allowed charge per RVU increased 10% from 1986 to 1987 but decreased 8% from 1987 to 1988. This may be the result of the phasing in of the laboratory fee schedule described earlier in this report. National limitations on lab reimbursement were imposed and tightened throughout the study period. This is of special interest because it represents a reversal of the increase in each study year found for all the other procedure groups.

The ten largest carriers exhibited patterns which are in general consistent with the imposition of the fee limitations. One exception, however, is Ohio which shows a decrease rather than an increase in the number of services per eligible and a decrease rather than an increase in number of RVUs per service. This results in a very large increase in the allowed charges per RVU (+115%). Most carriers show increases in the number of services per eligible (in the case of Florida and Texas there are very substantial increases of 57% and 51% respectively). In addition, most carriers show small or moderate increases in the number of RVUs per service. Except for Ohio, the percentage change in allowed charges per RVU ranges between -7% and +12%.

This pattern of a constraint in price (allowed charges per RVU) appearing to be associated with the provision of more and more intense services is troubling but not inconsistent with the literature.[12] A slowing of the increase in allowed charges per RVU -- one of the goals of the laboratory schedule -- appears to be associated with increases in the use and intensity of the tests ordered. Because the coinsurance

provisions of Medicare have been waived, this is especially problematic and suggests a fee schedule approach to physician fee payment reform may have unintended budget consequences. The phasing in of the schedule, which has resulted in overall lower allowed charges per RVU, may not be promoting the most efficient and effective delivery of laboratory services to Medicare beneficiaries.

By Place of Service and Procedure Group

Table 8 presents five selected variables for all procedures, medical procedures, surgical procedures, radiological procedures, and laboratory procedures by place of service. The first two of these utilization variables are measures of use, the use in the base year 1986 and the percentage change from 1986 to 1988. The next two variables are measures of service intensity, the numbers of RVUs per service in 1986, and the percentage change in RVUs per service from 1986 to 1988. The last variable could be considered a price variable, the percent change in allowed charges per RVU from 1986 to 1988.

The majority of services in 1986 were provided in office settings, i.e., 9.3 (or 49%) of the 19.0 services per eligible in 1986 had a place of service of office. Twenty-eight percent of the services were inpatient hospital services, 8% were outpatient hospital and 16% were services delivered in other places of service, such as SNF, ASC, or laboratory.

Overall, inpatient hospital service use increased more slowly than services in other places of service (5% for inpatient hospital services as compared to 16% for all services). Intensity of service use decreased in other places (-3%) and increased in the outpatient hospital setting (+12%) but remained reasonably stable in the office and inpatient hospital place of service (1.2% and .1% respectively). Changes in price were

Table 8

GROWTH IN SERVICES, RVUs*, ALLOWED AND BILLED CHARGES FOR ALL SERVICES, MEDICAL SURGICAL, RADIOLOGICAL, AND LABORATORY PROCEDURES, BY PLACE, 1986 – 1988

	# of Services/Eligible		#RVUs/Services		% Change In Allowed $/RVU
	1986	% Change	1986	% Change	
All Services	19.049	15.6	10.403	–1.0	7.9
Office	9.274	16.2	6.470	1.2	9.5
Inpatient Hospital	5.353	4.8	17.117	0.1	9.4
Outpatient Hospital	1.465	14.8	19.709	12.2	3.4
Other	2.958	33.7	5.973	–3.1	4.4
Medical Procedures	10.730	9.4	7.905	2.7	10.5
Office	5.634	12.6	6.782	2.4	10.2
Inpatient Hopsital	3.896	5.8	9.242	2.7	11.6
Outpatient Hospital	0.607	6.9	9.373	12.3	6.5
Other	0.594	5.4	8.278	2.6	10.3
Surgical Procedures	1.580	41.9	2.123	–20.7	5.8
Office	0.940	49.2	0.538	–23.1	11.9
Inpatient Hospital	0.281	0.9	6.935	1.5	6.1
Outpatient Hospital	0.136	30.6	5.165	1.5	0.0
Other	0.223	69.6	0.894	–20.3	7.1
Radiological Procedures	2.351	9.3	6.800	7.1	10.5
Office	0.625	14.0	5.805	16.7	3.0
Inpatient Hospital	1.013	0.4	7.295	1.4	11.1
Outpatient Hospital	0.652	17.3	7.245	8.8	7.2
Other	0.062	22.8	4.066	10.4	9.1
Laboratory Procedures	4.388	24.6	13.984	5.4	1.7
Office	2.075	11.5	10.123	11.1	0.6
Inpatient Hospital	0.163	15.2	32.539	–4.8	15.3
Outpatient Hospital	0.071	29.9	29.619	4.2	21.9
Other	2.079	38.3	15.845	0.8	–0.6

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* RVUs for all services are medical RVUs. RVUs for medical, surgical, radiological, and laboratory procedures are their own procedure group's RVUs.

greatest for office and hospital services (about 9%). The rates of increase for outpatient hospital and other places were 3% and 4% respectively.

For medical procedures, 53% of all services in 1986 were office services, 36% were inpatient hospital, 6% were outpatient hospital and 6% were services with other places of service.

The rate of increase in use was greatest for office visits (13%), however, their intensity increase was smallest (2%) and their prices went up 10%. Intensity increased most rapidly for outpatient hospital medical services even though the base RVUs per service in 1986 were the highest for outpatient hospital of the four places of service. As with all services, the percentage change in intensity was the largest and rate of increase in price was smallest for services where place of service equalled outpatient hospital.

Surgical procedures are performed most often in the office (59%) followed by the inpatient hospital (18%), other places (14%) and outpatient hospital (9%). Use of office services and services in other places of service show large increases (49% and 70% respectively). However, these places also show decreases (-23% and -20%) in service intensity. Outpatient hospital surgical service use increased substantially, up 31% from 1986. Inpatient surgical services per eligible increased only .9%. Price increased fastest in the office (+12%) and not at all in the outpatient hospital setting. In other places, surgical services allowed charges per RVU increased 7%, inpatient surgical services allowed charges per RVU increased 6%.

Forty-three percent of radiological procedures were performed in inpatient hospitals, 28% in outpatient hospitals, 27% in the office and 3% in other places of service. Inpatient hospital services had the smallest change in use per eligible (0.4%) and the smallest increase in intensity of services billed (1%), but the largest increase in allowed charge per RVU (11%). Outpatient services increased 17% in use, 9% in

intensity and 7% in price. Office visits increased 14% in use, 17% in intensity and 3% in price.

Almost all laboratory services are either performed in the office (47%), or other places of service (47%). Only 4% are for services where the place of service is inpatient hospital and only 2% for services where the place of service is outpatient hospital. Office laboratory services have increased less rapidly than those in other places of services (12% versus 38%) but their RVUs per service have increased more quickly (11% as compared to 0.8%). The percent change in allowed charges per RVU for both places has been close to zero at +0.6% for office laboratory service and -0.6% for other place of service laboratory services.

By Specialty and Procedure Group

Table 7 shows use, intensity and price measures by provider specialty from 1986 to 1988. Services delivered by "other" specialists make up the largest number of services per eligible (6.6) followed by those delivered by medical specialists (6.5), general practitioners (3.1) and surgical specialists (2.8). The increases in use are greatest for the other specialists (+23%), but the other specialists show a decrease in intensity of service use (-3%). General practitioners show the smallest increase in use (+7%) and a decrease in intensity (-3%). Both medical and surgical specialists show about the mean increase in use (13% and 14% respectively) and their intensity of services is relatively stable (+.1%, +.9% respectively). Changes in price are greatest for general practitioners (12%) and medical specialists (10%) followed by other specialists (+9%) and surgical specialists (+5%).

For medical procedures, most of the procedures are performed by medical specialists (45%) and general practitioners (21%), although 17% were provided by other specialists and 16% by surgical specialists. Other specialists had the largest

increase in medical procedure use (+15%) and medical procedure intensity (+5%) but the smallest increase in price (+9%). Surgical specialists had the next largest increase in use (+12%). Intensity increases were around 2% for general practitioners, medical specialists and surgical specialists.

For surgical procedures, most were performed by surgical specialists (41%), although a large percentage was also performed by medical specialists (31%), other specialists (17%) and general practitioners (11%). Surgical specialists showed the smallest increase in use, and smallest decrease in intensity with a 4% increase in prices. Other specialists had the largest increase in use (66%) but a substantial decrease in intensity (-36%) and a 1% decrease in price. General practitioners and medical specialists both had large increases in use (63% and 54% respectively) and strong decreases in service intensity (-42% and -26%). Both of them also had similar increases in allowed charges per RVU of 13% (general practitioners) and 14% (medical specialists).

Radiological procedures (see Table 8) are performed almost entirely by other specialists: only about 17% of the services are performed by general practitioners, medical specialists or surgical specialists. Radiological services performed by other specialties increased 9% in use, 6% in intensity and 14% in allowed charges per RVU.

Laboratory services are performed most often by other specialists (58%), followed by medical specialists and general practitioners (23% and 14% respectively) and finally by surgical specialists (5%). Other specialists have a dramatic increase in service use (35%), a small decrease in intensity (-0.1%) and a small increase in allowed charges per RVU (2%). Medical specialists and general practitioners have a more moderate increase in use (12% and 8% respectively), an increase in intensity (11% and 13% respectively) and a small price increase (1%). Surgical specialists have a moderate increase in use (13%) and intensity (9%) and a decrease in price (-6%).

Discussion

The Omnibus Budget Reconciliation Act of 1989 will radically change the way physicians will be paid under the Medicare program. Its implementation is based on the Resource-Based Relative Value Scale (RBRVS) developed by researchers at Harvard.[13] It is composed of three components: the Medicare Fee Schedule (MFS), Volume Performance Standards (VPS) and beneficiary protection. The MFS is calculated for each procedure as the sum of geographically adjusted relative values for the actual work, overhead and malpractice multiplied by a conversion factor. The conversion factor initially is to be set to guarantee budget neutrality. Volume Performance Standards may control the growth in volume and intensity of services. If the growth in services exceeds a fixed percentage, the conversion factor may be reduced in the subsequent year. To minimize beneficiary liability while and after the MFS is being phased in, physicians not accepting assignment will only be allowed to charge Medicare beneficiaries 9.25% above the MFS fee amount for providers.[14] This legislation when fully implemented in 1996 will dramatically affect physician payment. The specifics of its implementation which will be conducted over the next five years are of substantial importance.

We believe that our study has implications for this implementation. First, our data demonstrate that there are substantial differences in the amount and growth of various measures of utilization and cost. Substantial variation exists by procedure group, by place of service and by specialty, and perhaps most importantly, by carrier area. Geographic differences in the number and growth of services were profound over the 1986-1988 period and it is likely these trends continue today. Understanding the current differences by carrier areas is of substantial importance. Adjusting fairly for geographical differences[15] which may rise from very different bases is also an area of great concern.

Second, there will be substantial need for new and better data in the implementation of the new physician payment system. An area which needs to be addressed is the standardization of coding techniques, including local procedure codes, use of modifiers, payment for hospital-based physicians, assignment of specialty codes, and contents of global fees. Also of importance is the timing of the delivery of the data. While we understand that the current 1 1/2 year lag in data availability should be substantially shortened under the Common Working File, to the extent that this improvement does not occur or is delayed, data will not be available for use to effectively monitor the implementation.

Third, it is of great importance how providers, beneficiaries, Medigap, and other insurers react to the new reimbursement methodology. The possibility of increased Medigap-induced demand if Medigap policies tend to increase coverage of deductibles and copayments[16] may greatly affect the complexities of controlling physician costs. In addition as Medicare restricts balance billing, Medicare beneficiaries may find themselves with more disposable income which might fuel the demand for additional services.

Fourth, how the diffusion of technology advances will be controlled in the new system is of substantial importance. Two rapidly increasing growth rates not discussed above but illustrated in our full examination of these data[17] provide examples. One is coronary artery bypass surgery, three varieties of which, identified in our list of top 20 charges surgery procedure codes, make up 4.4% of surgical allowed charges in 1988. Increased use has been over 30% for all three procedures from 1986-1988. Usefulness of this technology to all those receiving it is an issue of concern. Second is the increased proliferation of lipid measurement. Three lipid measurement laboratory tests appear on the list of top 20 charges laboratory procedure codes making up 5.3% of all laboratory allowed charges in 1988. These three tests have increased in use 100%, over 200% and almost 600% over the three-

year period. This is despite the fact that efforts to lower cholesterol in the aged have yet to be demonstrated effective in decreasing their risk of heart attacks.

Fifth, our study has demonstrated the importance of the volume performance standards. The results from implementation of the lab fee schedule demonstrate that without measures to contain overall volume, numbers of services and their intensity will likely continue to increase. Volume performance standards, if properly implemented, can also provide incentives to physicians to collectively identify and eliminate unnecessary care. Research on effectiveness and development of practice guidelines should aid in these efforts.

But if volume performance standards are to have any possibility of success, they will need to be made meaningful to the individual doctor. Rewards or punishments cannot be on such a removed basis that the individual doctor feels helpless to affect the outcome. The more decentralized the volume performance standards, the greater the probability of successful implementation.

What remains of substantial concern in the implementation of the physician reform package outlined in OBRA89 is whether there exist politically viable technical solutions to implementing the volume performance standards. Without volume performance standards with real teeth, we believe the new physician reimbursement package will exacerbate rather than moderate the growth in physician expenditures.

NOTES AND REFERENCES

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2. Letch, Suzanne, Katherine Levit, and Daniel Waldo, "National Health Expenditures, 1987," Health Care Financing Review, 10:2 (Winter 1988), 109-122.

3. Non-PAR physicians in January 1987 were restricted to 96% of the prevailing charge level for PAR doctors and to a MAAC limit. The MAAC for each service is calculated as follows. The weighted average actual charge for a service in the base period is compared against 115% of the current year's prevailing charge. If the weighted average actual charge is equal to or greater than 115% of the current year's prevailing charge, then the MAAC limit is increased by a fraction (FY87 equals 1/4, FY88 equals 1/3, FY89 equals 1/2) of the difference between the weighted average actual charge and the 115% threshold. Service specific MAAC limits were enacted in April, 1988.

4. For PAR physicians, the MEI update for 1988 was 3.6% for primary care services and 1% for all other services. For non-PAR physicians, the MEI update was 3.1% for primary care services and 0.5% for all other services. In 1988, non-PAR doctors' prevailing charges were no more than 95.5% of the prevailing charges for PAR physicians. The percentage was reduced to 95% in 1989. Effective 1989 the MEI update for PAR physicians was 3% for primary care services and 1% for all other services. For non-PAR physicians it was 2.5% for primary care services and 0.5% for all other services.

5. Over time, the national limitations were tightened. For July 1986 through December 1986 the national limitation amount was 115% of the median of all fee schedules. For January 1987 through March 1988 the limitation was lowered to 109.6% of the median. In April 1988 the limitation was reduced to 100% of the median. Thus over time as the national limit was reduced, it more often became the constraint in determining the Medicare amount to be allowed.

6. Automated tests were multichannel tests and clinical chemistry tests. LCL tests were: cholesterol serum, complete blood count, blood count, hemoglobin, prothrombin time, sedimentation rate (ESR) Wintrobe, sedimentation rate (ESR) Westergren, glucose except urine, glucose blood, stick test, urinalysis, blood uric acid, blood urea nitrogen, and white blood cell count.

7. These 12 procedures (and their procedure codes) were: bronchoscopy (31622-31626), carpal tunnel repair (64721), cataract surgery (66830-66985), coronary artery bypass surgery (33510-33528), diagnostic and/or therapeutic dilation and curettage (58120), knee arthroscopy (29880-29881), knee arthroplasty (27466-

27447), pacemaker implantation surgery (33206-33208), total hip replacement (27130-27132), suprapubic prostatectomy (55821), transurethral resection of the prostate (52601), and upper gastrointestinal endoscopy (43235-43239).

8. Procedures greater than 150% of the weighted national average were reduced 15%. Procedures less than 150% of the weighted national average but more than 85% of the weighted national average were reduced by 3/13 of a percentage point for each percent that the 1987 prevailing charge exceeded 85% of the weighted national average.

9. Level II code conversions were developed as part of our study. Level III code conversions were accomplished by using the results of a study by Health Economics Research Inc.: Butrica, Barbara, Jill Hofmann, Janet Mitchell, Patricia Rioux, and John Schneider, "Summary of Local Code Conversion Process" Health Economics Research, Inc., June, 1990.

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11. RVUs were imputed by using the allowed charge for the missing RVU value and the average relationship of allowed charges to RVUs for that type of service.

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